What's Wrong with This Picture?

by Ray Schallom III

Over the past 7 years, the American Shotcrete Association's (ASA) Education Committee has been acquiring pictures concerning different shotcrete applications, safety, personal protection equipment (PPE), and environmental and QC/QA issues for the shotcrete training modules. The Education Committee continually updates these modules to keep up with changes in the industry standards. From time to time, ASA trainers will ask the attendees "What's wrong with this picture?" to see if anyone can point out the problems. It's a quick way for the trainer to determine who understands the importance of a safe shotcrete application. It also gives the trainer some insight into what areas need the most work.

This article contains several pictures that are used in the ASA training course. Look at each one of these pictures and test your shotcrete knowledge. Try to find what's wrong with each picture. The captions help to guide you in the right direction. You will find the correct answers at the end of this Technical Tip.

1. Clue: Safety and Application

3. Clue: Safety

2. Clue: Safety

4. Clue: Application

5. Clue: Safety and Application

8. Clue: Safety

6. Clue: Application

9. Clue: Safety and Application

7. Clue: Safety and Environmental

10. Clue: Safety and Application

11. Clue: Safety

12. Clue: Safety

Well, how do you think you did? If you missed a couple, you now see what you need to work on or review. If you missed more than a couple, you may want to consider taking the ASA Shotcrete Training Course to help improve your shotcrete knowledge. This course is well worth the time and money you will spend learning about the shotcrete process. All ASA Shotcrete Training Courses are conducted by approved ASA trainers and present the following curriculum content:

- History of Shotcrete
- Uses of Shotcrete
- Definition and processes
- Shotcrete terminology
- Mixture proportioning and specifications
- Preparation before shotcreting
- Shotcrete equipment
- Batching, mixing, and supply
- Shotcrete placement
- Encasing reinforcing steel
- Curing
- Safety
- Quality control

To arrange an ASA Training Session at your facility, visit www.shotcrete.org/ASAcertification.htm and click on the link that asks "How do I Schedule an ASA Training Session?"

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Here are the answers to what is wrong with each of the featured pictures:

1. The nozzleman is missing a respirator, safety glasses, gloves, and hearing protection. He is also holding the shotcrete hose incorrectly.

2. The nozzleman is not wearing gloves, a hard hat, safety glasses, or proper clothing to protect his skin from the shotcrete. The scaffold is not tied or anchored to the structure, there are no back rails in place, and he is standing on a plank of 2x4s with no fall protection. He is not holding the hose correctly due to the lack of scaffold boards.

3. The nozzleman is not wearing safety glasses or a dust mask. The scaffold has no safety back rails or toe board, and no fall protection is present. The shotcrete hose is also not secured (could pull the nozzleman off the scaffold).

4. This mine represents poor application (surface bond and compaction). The shotcrete placed overhead in this mine was shot at an angle. The ripples in the shotcrete indicate the direction it was shot.

5. Poor material velocity. The nozzleman is holding the shotcrete hose in an unsafe manner. ASA recommends holding the hose between the legs for stability. The nozzleman is not wearing a hard hat, safety glasses, or a dust mask.

6. As a result of not properly curing the shotcrete, shrinkage cracks developed in the shotcrete. You can see what remedial work had to be done to rectify the problem.

7. Lack of protective clothing, inadequate scaffolding, no hard hat, no gloves, no ear protection, and no respirator. No platform to collect the rebound and overspray from entering the water below.

8. There are too many men on the scaffold boards. The scaffold boards are cracked and have a broken end. There are no back rails or toe boards. The crew is not wearing any fall protection, safety glasses, hard hats, or hearing protection.

9. The nozzleman is not wearing a dust mask, safety glasses, or a hard hat. He is too far from the shooting surface and is not shooting perpendicular to the receiving surface. The helper behind the nozzleman is not wearing a hard hat, safety glasses, hearing protection, or a dust mask. The helper to the right of the nozzleman is not wearing safety glasses or a dust mask. The observer is missing a hard hat, safety glasses, earplugs, and protective clothing.

10. Shotcrete is being placed at the wrong angle causing the rolling effect. The nozzleman is not holding the hose correctly and is missing safety glasses, a dust mask, a hard hat, and the proper clothing to protect his skin from contact with the shotcrete.

11. The nozzleman is not wearing a hard hat, gloves, safety glasses, work boots or proper clothing to protect his skin from the concrete. He is standing on the back rail and has no fall protection and no toe board in place (OSHA violation).

12. The nozzleman is not wearing a hard hat, gloves, or safety glasses. He is standing on an improper scaffold with no braces, no back rails, and no toe boards. The scaffold boards are cracked and not properly leveled. He is holding the hose incorrectly.

In conclusion, a little bit of knowledge about the proper and safe application of shotcrete can go a long way!